Alphamin Announces Maiden Mineral Resource Estimate and Positive Preliminary Economic Assessment for Mpama South

written by Raj Shah | March 7, 2022

March 7, 2022 (Source) – Alphamin Resources Corp. (AFM:TSXV, APH:JSE AltX, "Alphamin" or the "Company"), a producer of 4% of the world's mined tin[2] from its high-grade operation in the Democratic Republic of Congo, is pleased to announce a Mineral Resource estimate and a positive Preliminary Economic Assessment (PEA) for Mpama South.

HIGHLIGHTS

- **Maiden Mineral Resource** declared on **Mpama South**, making it the **second highest grade** publicly reported CRIRSCO tin **Mineral Resource globally**[1] and one of the largest in terms of contained tin with:-
  - 0.83Mt @ 2.58% Sn for 21.5kt contained tin in the Indicated category; and
  - 1.95Mt @ 2.52% Sn for 49.1kt contained tin in the Inferred category
- **Significant resource growth potential on Mpama South** – drilling continues with considerable mineralisation intercepted beyond the Maiden Mineral Resource boundary
- **Positive PEA results for Mpama South**:-
  - Estimated **Annual contained tin** production of **7,232 tonnes** at an estimated **AISC**[2] **of US$15,188/t tin** (Basis a US$40,000/t tin price)

- Estimated **Annual EBITDA[2] of US$187m** at an assumed tin price of US$40,000/t
- **Estimated capital development cost of US$116m** providing a projected **short payback** in relation to annual EBITDA potential
- **Known implementation** with similar mining method, mining fleet and processing route as currently applied at the Company's adjacent Mpama North mine
- Estimated 20-month construction timeline
- Development infrastructure would join up with the currently producing Mpama North mine

Chief Executive Officer, Maritz Smith comments:

"We are delighted to declare a Maiden Mineral Resource estimate and the outcome of a PEA study on Mpama South. The PEA quantifies the potentially value accretive economics of expanding production with the development of the adjacent Mpama South mine. Our current producing Mpama North mine absorbs large fixed costs, which facilitates incremental production from Mpama South at a competitive marginal cost. Developing Mpama South would bring Alphamin closer to its vision of becoming one of the world's largest low-cost tin producers."

Mpama South Maiden Mineral Resource Estimate Declared

Following completion of the Phase 3 diamond drilling campaign in September 2021 and receipt of assays, a Mineral Resource Estimation (MRE) for the Mpama South project was commenced in December 2021. The MRE includes results from 79 drillholes totalling 23,109m, was estimated using the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Best Practice Guidelines (2019) and is reported in accordance with the 2014 CIM Definition Standards. Mineral Resources that are not Mineral Reserves do not have a demonstrated economic viability and

require advanced studies and economic analysis to prove their viability for extraction.

The Mineral Resource is classified into the Indicated and Inferred categories and is reported at a base case tin grade of 1.0%, which satisfies reasonable prospects for economic extraction. The Mineral Resource Statement with an effective date of 4 March is presented in Table 1:-

Classification	**Tonnes (millions)**	**Sn %**	**Sn Tonnes (thousands)**
Indicated[3]	0.83	2.58	21.52
Inferred[4]	1.95	2.52	49.12

The estimated Mineral Resource for Mpama South does not include the substantial quantity of subsequent drilling completed in Phases 4 and 5 since September 2021, which yield positive results with characteristic high grade visual cassiterite in many of the drillholes. Over 40 subsequent drillholes and over 10,000 metres beyond the limits of the Maiden MRE at Mpama South have been completed since Phase 3 – a visual illustration of mineralised intercepts against the maiden MRE is illustrated in Figure 1. Subsequent Mpama South MRE updates will be released throughout the remainder of the drilling phases in 2022 and beyond as assays are received.

The MRE has been completed by Mr. J.C. Witley (BSc Hons, MSc (Eng.)) who is a geologist with 33 years' experience in base and precious metals exploration and mining as well as Mineral Resource evaluation and reporting. He is a Principal Resource Consultant for The MSA Group (an independent consulting company), is registered with the South African Council for Natural Scientific Professions (SACNASP) and is a Fellow of the Geological Society of South Africa (GSSA). Mr. Witley has the appropriate relevant qualifications and experience to be

considered a “Qualified Person” for the style and type of mineralisation and activity being undertaken as defined in National Instrument 43-101 Standards of Disclosure of Mineral Projects.

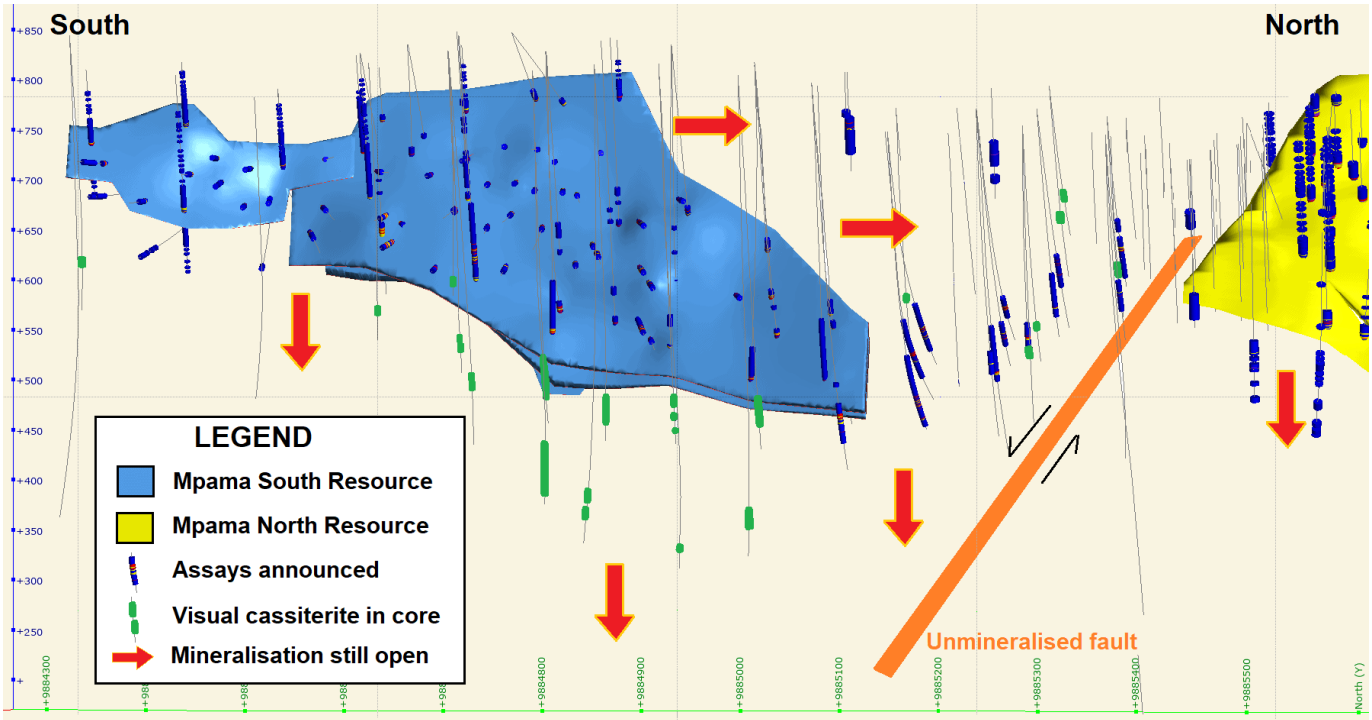

Figure 1: Mpama South and Mpama North becoming one deposit (View from East)

Preliminary Economic Assessment Results on Mpama South

The PEA encompassed various studies of a mining, metallurgical, environmental and regulatory nature. They demonstrated the potential viability of expanding production by developing the Mpama South Mineral Resource through leveraging the adjacent Mpama North Mine services (power, water, site access, underground infrastructure and personnel) coupled with the construction of a dedicated second lookalike processing plant and mine portal (Figure 2).

The PEA is preliminary in nature, it includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable

them to be categorized as Mineral Reserves. There is no certainty that the PEA results will be realized. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability, nor is there certainty that the Mineral Resource will be converted into Mineral Reserves.

Summary results from the PEA are tabulated below:-

Description	Unit	Value
Total run-of-mine (ROM) processed	‘000t	**2,068**
Avg. Annualised ROM mined and processed	‘000t	**468**
Avg. Annualised ROM grade	%Sn	**2.21**
Processing recovery	%	**70.0**
Avg. Annualised Contained tin produced	tonnes	**7,232**
Avg. Annualised AISC per tonne contained tin sold (At US$40,000/t tin price)	$/t tin	**15,188**
Avg. Annualised AISC per tonne contained tin sold (At US$30,000/t tin price)	$/t tin	**14,326**
Avg. Annualised EBITDA (At US$40,000/t tin price)	US$’000	**187,310**
Avg. Annualised EBITDA (At US$30,000/t tin price)	US$’000	**121,220**
Development Capital Estimate	US$’000	**115,970**

* The outputs are basis 100% of the project. Alphamin indirectly owns 84,14% of the project.

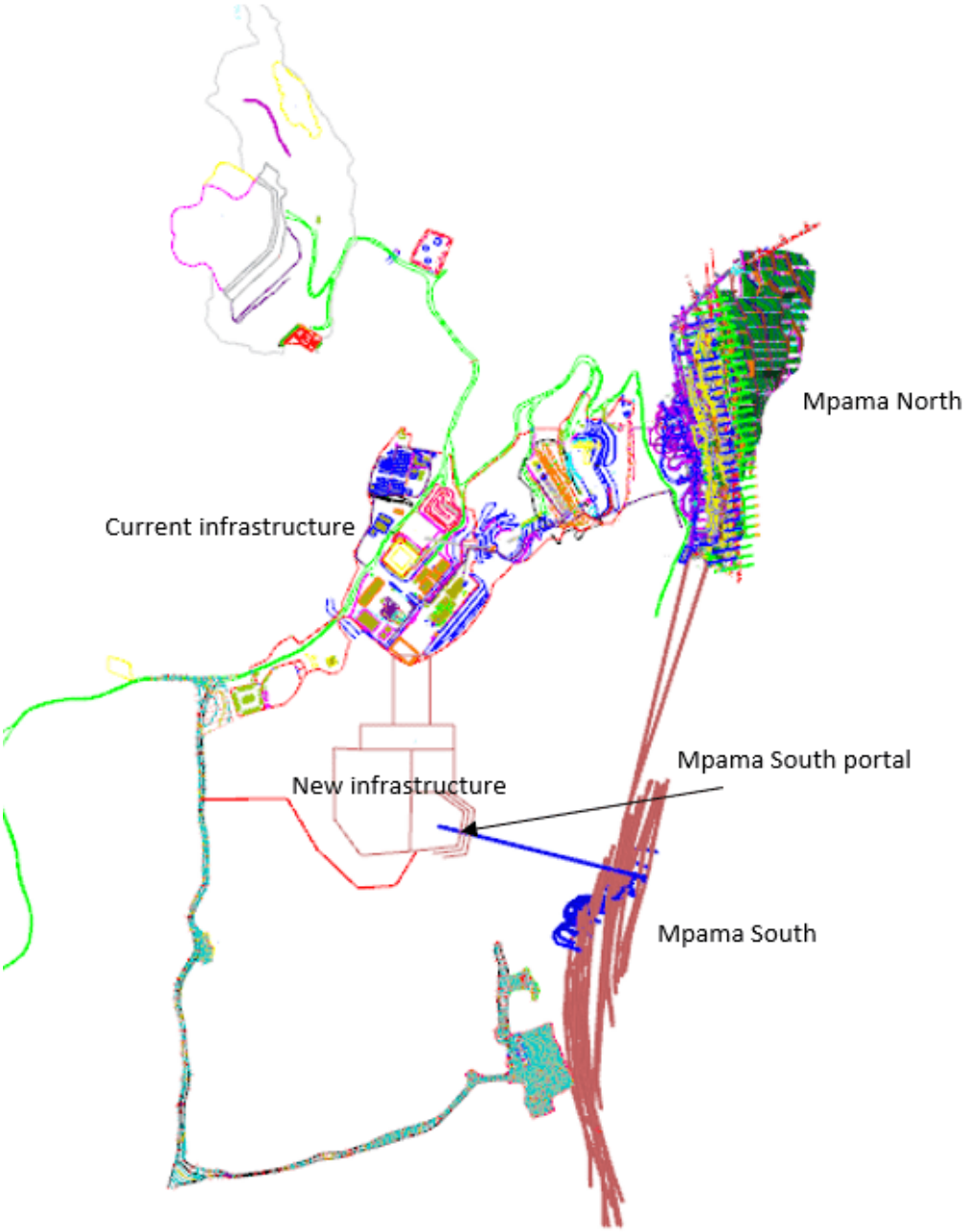

Figure 2: PEA Development Option (Plan View)

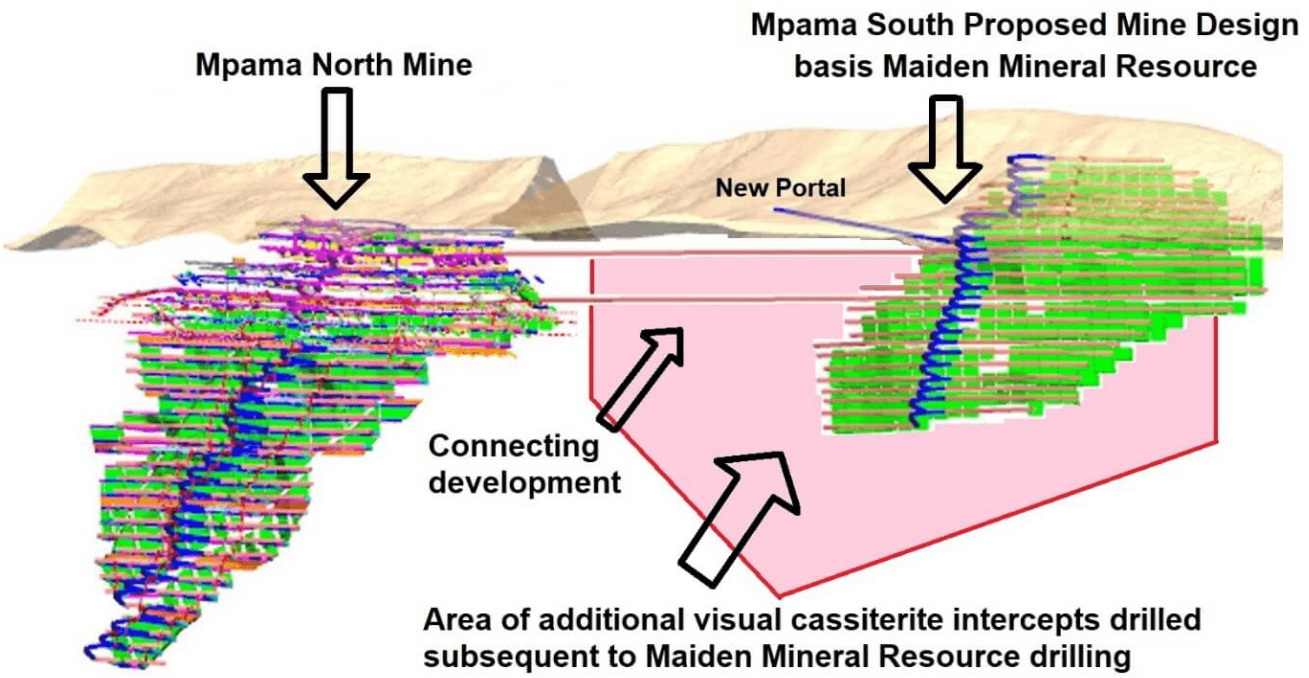

Figure 3: PEA Development Option (Oblique View from South West)

Mining studies were prepared by Bara Consulting (Pty) Limited who provides design and scheduling services for the operating Mpama North Mine. The study evaluated then selected a similar mining method and fleet to the current mining activities at Mpama North. An oblique view of development, stoping, the new portal and proposed connecting development is illustrated in Figure 3. Substantial exploration drilling after the cut-off date for the Maiden Mineral Resource estimate has been completed subsequently (Figure 1). This additional mineralisation beyond the boundaries of the PEA Resource is illustrated in Figure 3 in pink and reached within 40m of Mpama North underground development.

In October 2021, a representative bulk metallurgical sample derived from Mpama South Maiden resource drilling holes was exported to Maelgwyn Mineral Services in South Africa for comparative mineralogical and metallurgical studies. The mineralogy results are similar to the original Mpama North sample tested by Maelgwyn in 2015, but with marginally higher

metal sulphides and a finer tin deportment. Characterisation testwork delivered results comparable to the original Mpama North variability testwork and to current plant performance.

A trade-off review was conducted and concluded that constructing a new plant as opposed to expanding the current plant would be more advantageous in that the current mine production would not be affected during the plant's construction.

Bara Consulting (Pty) Limited estimated the capital costs for underground mine development and infrastructure based on current Mpama North cost structures adjusted, where appropriate, to reflect the Mpama South design criteria and parameters. Obsideo Consulting (Pty) Limited completed a detailed engineering costing study to determine the cost of replicating the processing plant and associated surface infrastructure. These studies formed the basis for the capital development cost estimate.

The expanded mine, processing plant and infrastructure requires an update to the existing Environmental Management Plan. Baseline studies have commenced.

Next Steps

In anticipation of further resource updates during 2022, including from in-fill drilling, the Company will proceed with the appointment of an EPCM contractor, detailed development scheduling and design work.

Qualified Persons

Mr Jeremy Witley, Pr. Sci. Nat., B.Sc. (Hons.) Mining Geology, M.Sc. (Eng.), is a qualified person (QP) as defined in National Instrument 43-101 and has reviewed and approved the scientific and technical information relating to Mineral Resources

contained in this news release. He is a Principal Mineral Resource Consultant of The MSA Group (Pty.) Ltd., an independent technical consultant to the Company.

Mr. Clive Brown, Pr. Eng., B.Sc. Engineering (Mining), is a qualified person (QP) as defined in National Instrument 43-101 and has reviewed and approved the scientific and technical information relating to the PEA contained in this news release. He is a Principal Consultant and Director of Bara Consulting Pty Limited, an independent technical consultant to the Company.

FOR MORE INFORMATION, PLEASE CONTACT:

Maritz Smith
CEO
Alphamin Resources Corp.
Tel: +230 269 4166
E-mail: msmith@alphaminresources.com

CAUTION REGARDING FORWARD LOOKING STATEMENTS

Information in this news release that is not a statement of historical fact constitutes forward-looking information. Forward-looking statements contained herein include, without limitation, statements relating to the results of the Mpama South PEA, including estimated development costs, estimated quantities of materials to be mined and processed, estimated grades, metallurgical recoveries and quantities of tin to be produced, and estimated costs of production and EBITDA, estimated time for mine construction, the merit

and potential viability of the project, estimated Mineral Resources for Mpama South, anticipated early development work for a mine at Mpama South and anticipated exploration activities and outcomes. Forward-looking statements are based on assumptions management believes to be reasonable at the time such statements are made. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. Although Alphamin has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. Factors that may cause actual results to differ materially from expected results described in forward-looking statements include, but are not limited to: uncertainties inherent in estimates of Mineral Resources, mine development and operating costs, mining volumes, grades and processing recoveries, particularly in light of the very early stage at which some of these estimates are being made, global economic uncertainties, volatility of metal prices, uncertainties with respect to social, community and environmental impacts, uninterrupted access to required infrastructure, adverse political events, impacts of the global Covid-19 pandemic on mining as well as those risk factors set out in the Company's Management Discussion and Analysis and other disclosure documents available under the Company's profile at www.sedar.com. Forward-looking statements contained herein are made as of the date of this news release and Alphamin disclaims any obligation to update any forward-looking statements, whether as a result of new information, future events or results or otherwise, except as required by applicable securities laws.

USE OF NON-IFRS FINANCIAL PERFORMANCE MEASURES

This announcement refers to the following non-IFRS financial performance measures:

EBITDA

EBITDA is profit before net finance expense, income taxes and depreciation, depletion, and amortization. This measure assists readers in understanding the cash generating potential of the project including liquidity to fund working capital, pay taxes, service debt, and funding capital expenditures and investment opportunities.

This measure is not recognized under IFRS as it does not have any standardized meaning prescribed by IFRS and is therefore unlikely to be comparable to similar measures presented by other issuers. EBITDA data is intended to provide additional information and should not be considered in isolation or as a substitute for measures of performance prepared in accordance with IFRS.

AISC

This measures the costs to produce a tonne of contained tin plus the capital sustaining costs to maintain the mine, processing plant and infrastructure. AISC includes mine operating production expenses such as mining, processing, administration, indirect charges (including surface maintenance and camp and tailings dam construction costs), smelting costs and deductions, refining and freight, distribution, royalties and product marketing fees. AISC does not include depreciation, depletion, and amortization, reclamation expenses, borrowing costs and exploration expenses. Contractual product marketing fees terminate in August 2024, following which date zero marketing fees have been included in estimated AISC and EBITDA.

Sustaining capital expenditures are defined as those expenditures which do not increase contained tin production at a mine site and excludes all expenditures at the Company's projects and certain expenditures at the Company's operating sites which are deemed expansionary in nature.

Risks relating to Mineral Resource Estimates

The figures for Mineral Resources contained in this news release are estimates only and no assurance can be given that the anticipated tonnages and grades will be achieved, that the indicated level of recovery will be realized or that the Mineral Resources could be mined or processed profitably. There are numerous uncertainties inherent in estimating Mineral Resources, including many factors beyond the Company's control. Such estimation is a subjective process, and the accuracy of any resource estimate is a function of the quantity and quality of available data and of the assumptions made and judgments used in engineering and geological interpretation. Short-term operating factors relating to the Mineral Resources, such as the need for orderly development of the ore bodies or the processing of new or different ore grades, may cause the mining operation to be unprofitable in any particular accounting period. In addition, there can be no assurance that metal recoveries in small scale laboratory tests will be duplicated in larger scale tests under on-site conditions or during production. Lower market prices, increased production costs, the presence of deleterious elements, reduced recovery rates and other factors may result in revision of its resource estimates from time to time or may render the Company's resources uneconomic to exploit. Resource data is not indicative of future results of operations. If the Company's actual Mineral Resources are less than current estimates or if the Company fails to develop its resource base through the realization of identified mineralized potential, its results of operations or financial condition may be materially

and adversely affected.

Neither the TSX Venture Exchange nor its regulation services provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this news release.

Appendix 1: SAMPLE PREPARATION, ANALYSES AND QUALITY CONTROL AND QUALITY ASSURANCE (QAQC)

After receipt of diamond drill core from the drillers at the drill rig in marked core trays, core was transported to the Company's core shed by the site geologist for logging and sampling. After sample mark up, lithological and geotechnical logging and photography, the core was split longitudinally in half using a water-cooled rotating diamond blade core saw. The cut core was replaced into the core tray with the half to be sampled facing upward. The Archimedes method of weight in air vs weight in water was used to provide relative density measurements on the whole length of the half core that was to be sampled and then replaced in the core trays.

Air dried samples were placed in pre-numbered sample bags together with pre-printed numbered sample tickets, which were cross-checked afterwards to prevent sample swaps. Sample bags were sealed using a plastic cable tie and then placed into poly-weave sacks which were in turn sealed with plastic cable ties. Each poly-weave sack was marked with a number and the sample numbers contained within, ready for delivery to the on-site Alphamin-Bisie laboratory (managed by Anchem) for sample preparation.

At the laboratory, samples were first checked off against the submission list supplied and then weighed and oven dried for 2 hours at 105 degrees Celsius. The dried samples were crushed by jaw crusher to 75% passing 2mm, from which a 250g riffle split

was taken. This 250g split was pulverised in ring mills to 90% passing 75µm from which a sample for analysis was taken. Samples were homogenised using a corner-to-corner methodology and two samples were taken from each pulp, one of 10g for on-site laboratory preliminary assaying and another 150g sample for export and independent accredited 3rd party laboratory assaying.

For the initial on-site laboratory assay, 10 grams of pulverised sample is mixed with 2 grams of binder before press pellet preparation at 20t/psi for 1 minute. Press pellets are analysed in a desktop Spectro Xepos XRF analyser, twelve at a time, for Sn, Fe, Zn, Cu, Ag, Pb and As along with a standard, duplicate and blank. The analytical method conducted on the pressed pellet has an expected 10% precision and an upper detection limit of 70,000ppm and lower detection limit of 500ppm. Over-limit samples are titrated by wet chemistry with an upper limit validation of 70% Sn. The on-site laboratory assays are merely an exploration tool and were not used for reporting the exploration results or Mineral Resource estimation, which are based solely on the ALS assays.

The 150g sample is packaged in sealed paper sample envelopes and packed in a box for export in batches of approximately 500 samples and prepared for export authorisation with national authorities. Once authorisation is received, samples are air-couriered to ALS Global in Johannesburg South Africa, a subsidiary of ALS Limited, which is an independent commercial analytical facility. ALS operations are ISO 9001:2015 certificated and the Johannesburg office is ISO 17025 accredited for Chemical Analysis by SANAS (South African National Accreditation System, facility number T087), although the accreditation does not extend to the methods used for tin.

Received samples at ALS Johannesburg are checked off against the list of samples supplied and logged in the system. Quality

Control is performed in the way of sieve tests every 50 samples and should a sample fail, the preceding 50 samples are ground in a ring mill pulveriser using a carbon steel ring set to 85 % passing 75µm. Samples are analysed for tin using method code ME-XRF05 conducted on a pressed pellet with 10% precision and an upper limit of 5,000ppm. The over-limit tin samples are analysed as fused disks according to method ME-XRF15c, which makes use of pre-oxidation and decomposition by fusion with 12:22 lithium borate flux containing 20% Sodium Nitrate as an oxidizing agent, with an upper detection limit of 79% Sn.

Method code ME-ICP61 (HF, HNO3, HClO4 and HCl leach with ICP-AES finish) is used for 33 elements including base metals. ME-OG62, a four-acid digestion, is used on ore grade samples for lead, zinc, copper and silver. Both methods are accredited by SANAS.

The program is designed to include a comprehensive analytical quality assurance and control routine comprising the systematic use of Company inserted standards, blanks and field duplicate samples, internal laboratory standards and analysis at an accredited laboratory. The pulps were accompanied by blind QAQC samples inserted into the sample stream by the Alphamin-Bisie geologists. These comprised blank samples, certified reference materials and pulp duplicates each at an insertion rate of approximately 5%.

The QAQC results demonstrate that the assay results are both accurate and precise with an insignificant amount of contamination (in the order of 10pmm Sn on average) and negligible sampling errors.

Laboratory verification work was conducted by check assays conducted at SGS South Africa (Pty) Ltd. This included 105 check samples submitted in November 2021. These samples comprised duplicated pulps from the maiden resource drillholes derived

from the sample preparation at the on-site laboratory. CRMs and blanks to an appropriate level also formed part of the 105-sample submission. Check assay results showed that there was a near zero overall bias and that inter-lab precision, after removal of <0.10% Sn samples ,was ~85% within 10% error and ~95% within 20% error. Given the nature of high-grade tin variability and previous knowledge of umpire check exercises at the operation, these results are considered acceptable.

Appendix 2: SIGNIFICANT INTERCEPTS (0.5% Sn lower threshold)

Hole	Easting	Northing	RL_m	Azi (°)	Dip (°)	From	To	Sn %	Width	Sample Position		
	GPS	GPS							(m)[1]	mid_x	mid_y	mid_z
BGH017	582535	9884822	732	55	-10	237.80	238.80	4.99	1.00	582,732	9,884,966	678.6
BGH018	582535	9884822	732	93	0	141.20	144.35	2.07	3.15	582,691	9,884,820	727.9
						145.75	151.00	0.76	5.25	582,696	9,884,820	727.9
BGH019	582535	9884822	732	85	-5	147.00	152.00	2.05	5.00	582,696	9,884,837	715.8
BGH020	582535	9884822	732	84	-15	160.60	164.40	1.45	3.80	582,704	9,884,846	689.3
						169.30	171.10	5.42	1.80	582,711	9,884,846	687.7
BGH021	582535	9884822	732	93	-15	109.15	110.25	3.20	1.10	582,654	9,884,821	700.1
						164.60	167.32	3.29	2.72	582,708	9,884,818	687.6
BGH022	582554	9884785	732	90	0	75.00	80.53	3.99	5.53	582,633	9,884,784	729.3
						109.00	110.00	1.35	1.00	582,664	9,884,785	729.9
						119.22	122.10	2.22	2.88	582,676	9,884,785	730.1
BGH023	582535	9884822	732	75	-15	171.43	174.32	1.72	2.89	582,710	9,884,859	683.7
						175.85	178.00	1.09	2.15	582,714	9,884,860	683
BGH024	582554	9884785	732	103	-5	127.70	129.60	0.54	1.90	582,679	9,884,749	717.2
						137.95	142.00	1.13	4.05	582,690	9,884,746	716.2
BGH025	582535	9884822	732	55	-20	212.25	213.40	0.60	1.15	582,724	9,884,919	662.3
						218.00	221.45	2.29	3.45	582,731	9,884,921	660.7
						222.70	223.70	13.05	1.00	582,734	9,884,923	659.9
						228.00	234.80	2.73	6.80	582,741	9,884,926	658
BGH026	582554	9884785	732	113	-10	103.71	108.00	3.30	4.29	582,649	9,884,735	713.7
						134.80	136.45	3.72	1.65	582,676	9,884,722	708.6
						161.00	162.50	5.61	1.50	582,699	9,884,711	704.5
BGH030	582554	9884785	732	115	-20	110.00	111.40	7.24	1.40	582,655	9,884,753	692.2
						141.90	152.50	4.85	10.60	582,686	9,884,745	680
						158.00	161.20	3.61	3.20	582,699	9,884,742	675.3
						174.45	175.80	11.03	1.35	582,713	9,884,738	670.5

BGH032	582554	9884785	732	125	-20	177.00	178.72	1.70	1.72	582,692	9,884,684	671.3
						182.00	188.25	3.00	6.25	582,697	9,884,679	669.1
						190.25	193.00	0.95	2.75	582,702	9,884,676	667.2
						194.40	202.00	1.37	7.60	582,707	9,884,672	665.3
						203.50	208.00	2.67	4.50	582,713	9,884,668	663.2
BGH034	582554	9884785	732	115	-25	174.80	178.00	11.99	3.20	582,689	9,884,696	653.3
						195.70	200.00	1.21	4.30	582,706	9,884,686	644.8
						202.37	206.65	1.86	4.28	582,711	9,884,683	642.3
						208.00	213.30	1.40	5.30	582,716	9,884,680	640.1
						216.25	221.30	1.42	5.05	582,722	9,884,676	637.3
						225.65	231.00	0.70	5.35	582,730	9,884,671	634
BGH027	582544	9884822	732	68	-27	212.35	214.00	0.58	1.65	582,729	9,884,879	634
						226.00	229.30	1.32	3.30	582,741	9,884,883	628.4
						235.45	236.58	1.54	1.13	582,749	9,884,885	625.2
BGH028	582554	9884785	732	90	-10	125.00	126.00	1.72	1.00	582,676	9,884,772	700.9
						136.10	137.18	1.85	1.08	582,687	9,884,770	698.4
						140.28	142.00	1.03	1.72	582,691	9,884,770	697.4
						147.46	151.25	2.88	3.79	582,699	9,884,769	695.5
BGH029	582544	9884822	732	93	-25	126.00	128.35	4.66	2.35	582,663	9,884,826	678.5
						178.90	184.05	1.25	5.15	582,713	9,884,827	657.7
						193.70	196.05	3.95	2.35	582,726	9,884,827	653
BGH031	582544	9884822	732	75	-25	208.00	211.53	0.99	3.53	582,729	9,884,876	639.9
						219.40	222.38	1.16	2.98	582,739	9,884,879	636
BGH033	582544	9884822	732	60	-27	259.00	265.46	7.32	6.46	582,756	9,884,929	612.8
						268.53	270.52	1.02	1.99	582,762	9,884,931	610
BGH035	582554	9884785	732	90	-25	152.00	165.00	2.96	13.00	582,686	9,884,816	665
						171.00	173.60	1.47	2.60	582,703	9,884,815	657.4
						176.60	180.08	2.40	3.48	582,709	9,884,814	654.9
BGH036	582544	9884822	732	65	0	147.45	151.35	2.31	3.90	582,687	9,884,878	724.8
						156.63	160.65	0.93	4.02	582,696	9,884,881	724.7
BGH037	582554	9884785	732	105	-30	154.00	157.00	3.81	3.00	582,680	9,884,741	647.5
						194.60	197.55	1.54	2.95	582,712	9,884,730	626
						207.95	211.18	1.29	3.23	582,723	9,884,726	619.3
						216.25	220.15	2.79	3.90	582,730	9,884,723	615.1
						222.40	226.70	1.77	4.30	582,735	9,884,721	612.1
BGH038	582544	9884822	732	75	-30	151.70	154.60	5.22	2.90	582,677	9,884,851	654.3
						218.30	223.65	3.38	5.35	582,735	9,884,861	621.4
						226.70	231.50	1.95	4.80	582,743	9,884,862	617.6

BGH039	582554	9884785	732	100	-22	112.08	113.00	2.12	0.92	582665.1	9,884,755	687.6
						116.30	120.95	3.33	4.65	582,661	9,884,753	686.1
						145.00	166.00	2.20	21.00	582,696	9,884,744	674.2
						174.50	176.00	0.95	1.50	582,713	9,884,739	668.9
BGH040	582544	9884822	732	60	-30	232.00	233.00	0.95	1.00	582,725	9,884,922	618.2
						273.70	277.05	3.79	3.35	582,761	9,884,937	600
BGH041	582500	9884847	732	55	-25	340.00	344.50	3.03	4.50	582,807	9,885,002	599.5
BGH042	582544	9884822	732	60	-35	277.35	280.00	1.93	2.65	582,751	9,884,922	569.4
						308.50	312.00	0.62	3.50	582,776	9,884,932	552.6
						313.00	315.55	1.52	2.55	582,779	9,884,933	550.5
BGH043	582544	9884822	732	100	-10	102.50	104.15	2.69	1.65	582,644	9,884,808	709
						123.00	124.00	1.06	1.00	582,663	9,884,805	704.8
						163.64	167.00	2.82	3.36	582,704	9,884,798	696.7
BGH044	582500	9884847	710	70	-35	330.00	334.13	1.31	4.13	582,764	9,884,941	533.4
BGH045	582544	9884822	732	100	-20	120.65	121.75	31.55	1.10	582,656	9,884,806	687.4
						156.00	159.40	0.56	3.40	582,689	9,884,799	674.7
						176.70	183.62	3.24	6.92	582,708	9,884,795	668.1
BGH046	582544	9884822	732	100	-30	195.18	206.00	2.85	10.82	582,712	9,884,795	630.5
						212.53	215.18	1.90	2.65	582,723	9,884,793	623.7
						218.00	220.60	7.16	2.60	582,728	9,884,792	620.8
						225.00	226.00	4.36	1.00	582,733	9,884,791	617.7
BGH047	582565	9884535	718	60	0	121.58	124.57	0.91	2.99	582,653	9,884,879	739.2
						147.09	148.09	1.28	1.00	582,675	9,884,889	741.1
BGH048	582567	9884509	727	90	0	140.75	143.05	0.90	2.30	582,708	9,884,496	727.7
						146.53	148.00	0.74	1.47	582,713	9,884,495	728
BGH049	582565	9884535	718	65	-15	145.40	147.40	4.27	2.00	582,689	9,884,599	674.5
BGH050	582567	9884509	727	105	-5	160.00	161.38	1.06	1.38	582,722	9,884,469	711.7
BGH051	582565	9884535	718	40	0	134.80	137.00	2.23	2.20	582,662	9,884,630	712.3
						151.00	156.30	1.20	5.30	582,675	9,884,642	711.4
						164.18	169.45	3.95	5.27	582,685	9,884,651	710.8
						171.27	172.57	4.08	1.30	582,688	9,884,655	710.6
BGH052	582567	9884509	727	120	0	205.90	207.10	1.86	1.20	582,732	9,884,385	722.9
BGH053	582565	9884535	718	40	-15	173.73	176.93	9.58	3.20	582,685	9,884,653	669.2
						178.55	181.43	4.07	2.88	582,688	9,884,656	667.9
						192.41	196.86	3.28	4.45	582,698	9,884,666	664
						198.86	206.77	2.45	7.91	582,704	9,884,671	661.8
						207.53	209.50	5.04	1.97	582,708	9,884,675	660.3
						214.65	216.00	2.32	1.35	582,713	9,884,680	658.6
BGH054	No significant intercepts											
BGH055	582565	9884535	718	80	-15	145.00	146.00	0.62	1.00	582,705	9,884,549	682.7

BGH056	No significant intercepts											
BGH057	No significant intercepts											
BGH058	582565	9884510	727	95	-5	153.35	155.60	1.98	2.25	582,717.3	9,884,501.2	703.9
BGH059	582567	9884536	718	95	0	165.00	166.00	3.63	1.00	582,732.3	9,884,528.3	714.4
BGH060	No significant intercepts											
BGH061	582567	9884536	727	130	-10	157.57	159.19	1.22	1.62	582,719	9,884,525	677.7
BGH062	582567	9884537	718	95	-15	154.00	156.00	2.18	2.00	582,695	9,884,589	650.2
BGH063	582782	9884646	829	270	-70	186.25	194.37	0.82	8.12	582,719	9,884,661	650.5
						197.42	202.45	1.12	5.03	582,715	9,884,661	641.8
						205.00	209.05	0.83	4.05	582,712	9,884,661	635.4
						211.13	218.90	2.06	7.77	582,709	9,884,661	628.3
						220.40	222.55	0.86	2.15	582,706	9,884,661	622.5
						231.00	233.00	0.87	2.00	582,701	9,884,661	613
BGH064	582888	9884976	839	270	-50	220.80	222.60	0.63	1.80	582,746	9,884,976	668.9
BGH065	582913	9885057	819	270	-60	271.00	275.95	2.93	4.95	582,769	9,885,057	586.1
						291.56	292.56	1.70	1.00	582,759	9,885,057	570.9
BGH066	582888	9884976	839	270	-60	276.00	278.59	8.49	2.59	582,754	9,884,965	596.1
						300.00	301.00	1.78	1.00	582,742	9,884,965	576.6
BGH067	582913	9885057	819	270	-67	295.75	300.47	3.21	4.72	582,789	9,885,065	548.1
						303.00	304.62	1.56	1.62	582,786	9,885,065	543.1
						337.00	338.00	0.55	1.00	582,769	9,885,068	514.3
BGH068	582913	9885057	819	270	-50	247.00	248.20	2.10	1.20	582,749	9,885,051	633.1
						251.80	255.10	1.75	3.30	582,745	9,885,051	628.8
BGH069	582888	9884976	839	270	-70	321.80	324.73	3.84	2.93	582,779	9,884,962	534.7
BGH070	582913	9885057	819	270	-73	331.00	336.35	3.00	5.35	582,802	9,885,040	505.2
BGH071	No significant intercepts											
BGH072	582852	9884845	831	270	-67	274.60	279.70	2.70	5.10	582,749	9,884,847	574
						290.40	294.80	3.61	4.40	582,742	9,884,847	560
BGH073	582731	9884691	838	280	-60	121.00	123.00	0.72	2.00	582,671	9,884,702	731.9
BGH074	582944	9885130	798	270	-67	278.90	283.93	2.85	5.03	582,810	9,885,137	551.2
						285.49	289.10	1.60	3.61	582,807	9,885,138	546.3
						294.51	297.30	7.14	2.79	582,802	9,885,139	539.1
						299.65	303.34	0.53	3.69	582,799	9,885,139	534.5
BGH075	582731	9884691	838	270	-70	115.40	116.65	6.76	1.25	582,690	9,884,690	729.4
						119.50	120.80	15.22	1.30	582,688	9,884,690	725.7
						125.09	129.80	3.56	4.71	582,684	9,884,690	719.3
						162.55	164.63	8.94	2.08	582,667	9,884,689	687.8

BGH076	582752	9884801	849	300	-40	108.00	109.00	0.84	1.00	582,682	9,884,844	779.6
						118.80	119.45	3.71	0.65	582,675	9,884,848	772.7
						128.15	131.00	2.82	2.85	582,668	9,884,852	765.8
						136.70	137.00	0.97	0.30	582,663	9,884,855	761
BGH077	582944	9885130	798	270	-72	316.84	321.20	2.57	4.36	582,830	9,885,130	501.7
						323.00	328.36	2.56	5.36	582,827	9,885,130	495.8
						329.06	330.13	0.52	1.07	582,825	9,885,130	492.4
						335.25	337.36	9.63	2.11	582,822	9,885,130	486.5
						339.77	340.07	7.07	0.30	582,820	9,885,131	483.4
BGH078	582752	9884801	849	280	-40	102.00	106.00	1.88	4.00	582,674	9,884,816	782.6
						108.00	109.00	0.62	1.00	582,671	9,884,817	779.7
						115.00	117.15	0.80	2.15	582,665	9,884,818	774.8
BGH079	582852	9884845	831	270	-73	290.15	294.40	1.00	4.25	582,765	9,884,842	552.6
						296.30	302.30	9.46	6.00	582,763	9,884,841	546.1
						304.81	305.70	18.75	0.89	582,761	9,884,841	540.5
						312.00	313.00	1.08	1.00	582,758	9,884,841	533.8
						316.90	321.63	4.65	4.73	582,755	9,884,840	527.5
						322.57	328.00	5.41	5.43	582,753	9,884,840	522
						328.95	329.48	1.59	0.53	582,751	9,884,840	518.4
						340.68	341.42	4.29	0.74	582,747	9,884,839	507.6
BGH080	582944	9885130	798	270	-75	339.90	343.60	1.05	3.70	582,853	9,885,141	469.2
						345.00	346.55	4.11	1.55	582,851	9,885,141	465.5
						360.70	361.00	11.95	0.30	582,846	9,885,143	451.5
BGH081a	583022	9885299	776	270	-50	269.00	274.56	1.99	5.56	582,838	9,885,306	578.6
						275.56	275.86	0.64	0.30	582,835	9,885,307	576.0
BGH082a	583013	9885209	752	270	-50	263.83	266.30	3.43	2.47	582,836	9,885,222	556.0
						268.35	269.15	3.32	0.80	582,833	9,885,223	553.5
						276.97	277.27	15.65	0.30	582,827	9,885,224	547.9
BGH083	No significant intercepts											
BGH084	583023	9885299	776	270	-57	278.95	280.90	6.25	1.95	582,857	9,885,307	552.8
						283.06	286.31	1.28	3.25	582,854	9,885,307	549.2
BGH085	583023	9885299	776	270	-65	294.65	298.35	0.83	3.70	582,890	9,885,304	512.9
BGH086	583013	9885208	752	270	-57	275.35	280.78	3.07	5.43	582,847	9,885,214	530.1
						286.05	286.51	18.90	0.46	582,841	9,885,215	524.4
MND001	No significant intercepts											
MND002	No significant intercepts											
MND003	No significant intercepts											
MND004	583392	9886283	682	270	-52	524.76	525.06	0.67	0.30	582,994	9,886,250	347.0
MND005	No significant intercepts											
MND006	No significant intercepts											

MND007	583100	9886210	726	270	-75	402.00	402.45	0.58	0.45	582,987	9,886,211	340.5
MND009	582881	9886200	752	270	-65	96.35	96.75	2.28	0.40	582,842	9,886,200	667.3
MND010	No significant intercepts											
MND011	583103	9886211	726	270	-83	419.26	428.00	21.85	8.74	583,021	9,886,194	312.7
						430.60	438.90	17.52	8.30	583,018	9,886,193	302.0
MND012	582950	9886140	765	270	-60	64.70	65.35	12.20	0.65	582,916	9,886,142	699.8
1. Apparent widths, not true thickness												

Appendix 3: Checklist of Assessment and Reporting Criteria

Drilling techniques	All drillholes were diamond drill cored and drilled from surface (most intersections drilled using NQ size), holes drilled orientated in an east-west direction were angled between -60° and -70°. Holes collared in the west were drilled out in fan patterns into the side of a hill and angled between 0° and minus 35°.
Logging	All of the drillholes were geologically logged by qualified geologists. The logging is of an appropriate standard for grade estimation.
Drill sample recovery	Core recovery in the mineralised zones was observed to be very good and is on average greater than 97%.
Sampling methods	Half core samples were collected continuously through the mineralised zones after being cut longitudinally in half using a diamond saw. Drillhole samples were taken at nominal 1 m intervals, which were adjusted to smaller intervals in order to target the cassiterite vein zones. Lithological contacts were honoured during the sampling. MSA’s observations indicated that the routine sampling was performed to a reasonable standard and is suitable for evaluation purposes.

Quality of assay data and laboratory tests	At the on-site ABM laboratory (managed by Anchem), samples were first checked off against the submission list supplied and then weighed and oven dried for 2 hours at 105 degrees Celsius. The dried samples were crushed by jaw crusher to 75% passing 2mm, from which a 250g riffle split was taken. This 250g split was pulverised in ring mills to 90% passing 75µm from which a sample for analysis was taken. Samples were homogenised using a corner-to-corner methodology and two samples were taken from each pulp, one of 10g for on-site laboratory assaying and another 150g sample for export and independent accredited 3rd party laboratory assaying. Received samples at ALS Johannesburg are checked off against the list of samples supplied and logged in the system. Quality Control is performed by way of sieve tests every 50 samples and should a sample fail, the preceding 50 samples are ground in a ring mill pulveriser using a carbon steel ring set to 85 % passing 75µm. Samples are analysed for tin using method code ME-XRF05 conducted on a pressed pellet with 10% precision and an upper limit of 5,000ppm. The over-limit tin samples are analysed as fused disks according to method ME-XRF15c, which makes use of pre-oxidation and decomposition by fusion with 12:22 lithium borate flux containing 20% Sodium Nitrate as an oxidizing agent, with an upper detection limit of 79% Sn. Prior to the 2021 drilling the assays were also conducted at ALS Global in Johannesburg where samples were analysed for tin using fused disc ME-XRF05 with 10% precision and an upper limit of 10 000 ppm. This was reduced to 5,000 ppm from 2014 onwards. Over limit samples were sent to Vancouver for ME-XRF10 which uses a Lithium Borate 50:50 flux with an upper detection limit of 60% and precision of 5%. ME-ICP61, HF, HNO3, HCL04 and HCL leach with ICP-AES finish was used for 33 elements including base metals. ME-OG62, a four-acid digestion, was used on high grade samples for Pb, Zn, Cu & Ag. External quality assurance of the laboratory assays for the Alphamin samples was monitored. Blank samples (186), certified reference materials (264) and duplicate samples (200) were inserted with the field samples accounting for approximately 11% of the total sample set. The QAQC measures used by Alphamin revealed the following: • Blank samples indicated that no significant contamination occurred overall. Low levels of contamination (mostly <200 ppm Sn) mostly occurred, however 5 values between 229 ppm and 1,285 ppm were returned. Given the high grades at Bisie, the levels of contamination are not significant. • Five different CRMs were used with expected values between 0.18% and 31.42% Sn. The lower grade CRMs were prepared by Ore Research and Exploration (OREAS) and the two high grade CRMs (4.19% and 31.42% Sn) by the Bureau of Analysed Samples Ltd (BCS). In general, ALS returned values within the tolerance limits (three standard deviations) for the OREAS CRMs, although slightly lower than the expected value. Assays of the highest grade BCS CRM were mostly outside of the three standard deviation limits but within ±4%of the expected value. For the 5.07% Sn BCS CRM, assays were consistently lower than the expected value by as much as 7%. Overall, the CRMs results indicate a slight negative bias for the ALS assays. • Coarse duplicates show mostly excellent correlation, indicating minimal error in the process and a high degree of repeatability.

Verification of sampling and assaying	The mineralisation in thirteen of the drillholes completed in 2021 at Mpama South were visually verified during a site-visits by the QP in August 2021 and several of the initial drillholes were examined during earlier site visits to Bisie. The QP observed the mineralisation in the cores and compared it with the assay results. It was found that the assays generally agreed with the observations made on the core. Core photos from the drilling programme have regularly been provided to the QP for inspection. 105 pulp duplicates were sent to SGS (Johannesburg) in November 2021 for confirmation assaying. • The pulp duplicates showed acceptable correlation with the ALS assays at both high- and low-grade ranges with an overall bias of near zero. - Average bias for grade ranges > 1% is less than 1%. - Tendency for ALS to be higher (~5%) for the grade ranges less than 1%. • Inter-lab precision (after removal of <0.10%) is 85% within 10% error and 95% within 20% error
Location of data points	The drillhole collar positions were surveyed using a differential GPS. Downhole surveys were completed using a multishot down-hole survey instrument (Reflex EZ-Track), or north seeking gyro (Reflex EZ-Gyro / Reflex Gyro Sprint-IQ).
Tonnage factors (in situ bulk densities)	Relative density measurements were made on the majority of recent drillhole samples using the Archimedes Principle of weight n air versus weight in water. A regression formula of tin grade against relative density was developed and applied to the samples that did not have direct measurements. The assigned specific gravity was interpolated into the block model using ordinary kriging.
Data density and distribution	A total of 82 holes were drilled in Mpama South. Holes were drilled steeply from east to west, along section lines spaced approximately 60 m to 80 m apart. Several sets of holes were drilled in a fan pattern into the side of a steep hill, with orientations spanning from the northeast to the southeast (from azimuth 045° to 125°). These drillholes fans intersect the mineralisation 25 m to 40 m apart in most of the Mineral Resource area.
Database integrity	Data was provided as Excel files. MSA completed spot checks on the database and is confident that the Alphamin database is an accurate representation of the original data collected.
Dimensions	The mineralisation consists of seven zones, with a total extent of 800 m along strike. The two main zones, MZ1 and MZ2, have a strike length of 600 m and 280 m down-dip, accounting for 77% of the Mineral Resource. The zones occurring in the footwall and hangingwall of the MZ1 and MZ2 tend to be narrower and irregular in shape with strike lengths from 100 m to 300 m. MZ6, which is located to the south has a strike length of 270 m and a dip length of 110 m.

Geological interpretation	The mineralised intersections in drill core are clearly discernible. The Mineral Resource is interpreted to occur as irregular tabular mineralised zones, dipping 65-70° to the east, containing several narrow veins and disseminations of cassiterite. The mineralised zones are hosted in chlorite schist that is the result of intense hydrothermal alteration associated with a fracture system. The two main zones of the Mineral Resource (MZ1 and MZ2) are continuous for almost 600 m, with average thicknesses of 4.3 m and 3.3 m respectively. However, the thicknesses of these two zones vary from as little as 1 m, up to 14 m thick. Three smaller zones (MZ3 to MZ5) occur in the footwall of the main mineralisation which progressively become narrower, moving away from the main zone. MZ3 thickness ranges from 1 m to 9 m with an average thickness of 1.5 m. MZ4 has an average thickness of 1 m, attaining a maximum thickness of 5 m. MZ5 has an average thickness of 1.2 m, ranging from 1 m to 5 m. All zones become narrower along the edges, where they pinch-out. A small, narrow zone (MZ7) occurs in the hangingwall of the main mineralisation with an average thickness of 0.5 m and a maximum thickness of 4 m. MZ6, which occurs to the south, tends to be lower in grade and has an average thickness of 4 m, ranging from 1 m up to 9 m. A three-dimensional wireframe model was created for the seven zones of mineralisation based on a grade threshold of 0.40% Sn. The MZ1 and MZ2 make up the main zone, which are the most consistent zones and occur within a persistent chlorite schist. Narrower less continuous zones occur above and below the main zone within chlorite-mica schists.
Domains	The mineralisation was modelled as seven tabular zones containing irregular vein style mineralisation. A hard boundary was used to select data for estimation in order to honour the sharp nature of vein boundaries.
Compositing	Sample lengths were composited to 1 m by length and density weighting.
Statistics and variography	Statistics for the seven estimation domains show distributions that are positively skewed with coefficients of variation (CV) ranging from 1.3 to 1.96, the only exception being domain MZ7 which shows lower variability due to very few composites resulting in a CV of 0.79. The two main zones (MZ1 and MZ2) have similar average tin grades (2.22% and 2.11% respectively). The smaller, footwall zones (MZ3 to MZ5) are higher in tin grade with averages ranging from 3% to 4.41% while MZ6 and MZ7 are lower in tin grade, with an average of 0.63% and 1.07% respectively. Normal Scores semivariograms were calculated in the plane of the mineralisation, down-hole and across strike. Variograms were modelled for tin, with a range of 40 m within the plane of mineralisation and with a range of 3 m across the structures.
Top or bottom cuts for grades	Top caps were applied to outlier values, identified as breaks in the cumulative, probability plots.
Data clustering	Data clustering occurs where the fan drilling, collared on the western side of the deposit, intersect the surface drilling collared in the east, resulting in a data spacing of 25 m to 40 m towards the centre of the deposit. Outside of this area, the grid spacing becomes more regular, 60m to 80 m along strike and 50 m down-dip.
Block size	A rotated block model with a parent cell of 10 mX by 10 mY by 2 mZ was used. Sub-celling was used to divide the parent cells to a minimum sub-cell of 1 mX by 1mY by 0.2 mZ to closely fit the narrow portions of the vein structures

Grade estimation	Tin, copper, lead, zinc, silver, arsenic and density were estimated using ordinary kriging. A minimum number of 4 and a maximum of 10 one metre composites were required for the tin and density estimates. A minimum of 4 and maximum of 8 composites were used for the other elements. Estimation was carried out in three passes, with the first pass using search volumes coinciding with the variogram ranges. A second pass estimate expanded the search volumes by a factor of 1.5 to estimate blocks where insufficient samples were present for an estimate in the first pass. Where blocks remained un-estimated from the first two passes, a third pass, using an expansion factor of 10 was used to ensure all blocks in the model received a grade and density estimate. Dynamic Anisotropy was used to orientate the search volumes to the strike and dip of the individual mineralised zones.
Resource classification	Indicated Mineral Resources were declared where the drillhole spacing is approximately 40 m and where the geological model has low variability. The remainder of the interpreted model was classified as Inferred Mineral Resources, corresponding to areas informed by drilling spaced 50 m to 80 m apart with a maximum extrapolation of 20 m from the nearest drillhole.
Mining cuts and cut-off grade assumptions.	A minimum of 1 m was applied to the mineralisation model. The thickness, grade and steep dip implies that the Mineral Resource can be extracted using established underground mining methods similar to those applied at Mpama North. A 1% cut-off grade was applied based on the Mpama North costs and prevailing tin price. Isolated blocks above cut-off grade in dominantly low-grade areas of the model were not included in the Mineral Resource
Metallurgical factors or assumptions	The tin mineralisation occurs as cassiterite, an oxide of tin (SnO_2). At Mpama North gravity separation is used to produce a tin concentrate. The Cu, Zn and Pb mineralisation occurs as sulphides, which are removed by flotation to create the cassiterite product. It is assumed that similar processes will be used to process the Mpama South mineralisation.
Legal aspects and tenure	Alphamin through its wholly owned DRC subsidiary, Alphamin Mining Bisie SA, has a Mining License PE 13155 which includes the Bisie Tin Mine. Alphamin has an 80.75 percent interest in ABM. The Government of the Democratic Republic of Congo (GDRC) has a non-dilutive, 5% share in ABM.
Audits, reviews and site inspection	The following review work was completed by MSA: • Inspection of approximately 20% of the mineralised core intersections used in the Mineral Resource estimate. • Database checks. • Inspection of Mpama South drill sites in August 2021. • On-site review of the exploration processes. • Laboratory inspections.

---

1 Data obtained from International Tin Association Tin Industry Review 2020

[2] This is a non-GAAP financial measure, is not standardized and may not be comparable to similar financial measures of other

issuers. See “Use of Non-IFRS Financial Performance Measures” below for a further explanation of this performance metric and how it is calculated.

[3] CIM Definition: An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors insufficient detail to support mine planning and evaluation of the economic viability of the deposit.

[4] CIM Definition: An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.